# Project Name:

Sentiment Analytics

# Company Name:

Sentiment Analytics 82

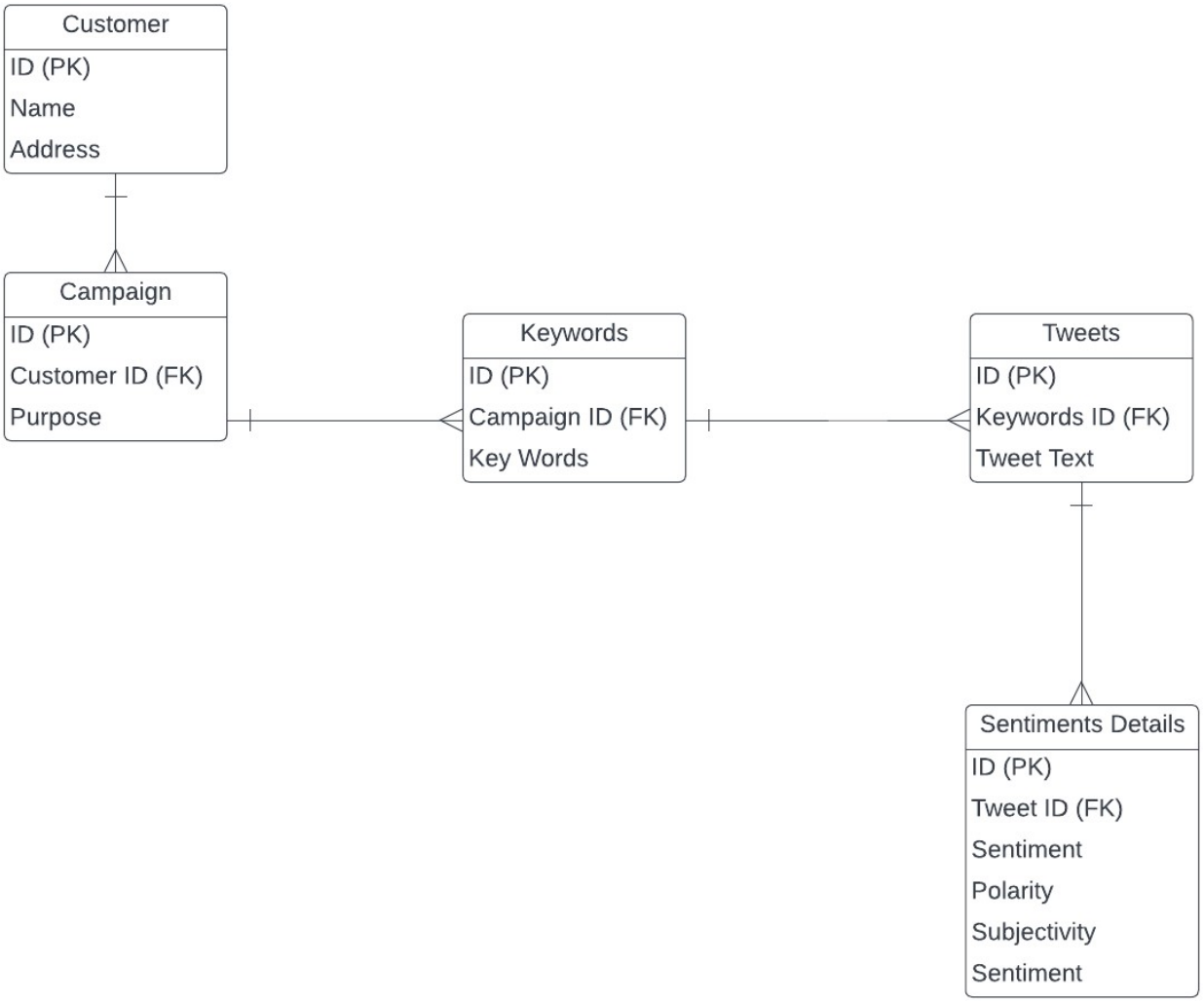
# Business Justification

Gauge public sentiments for products and/or brands.

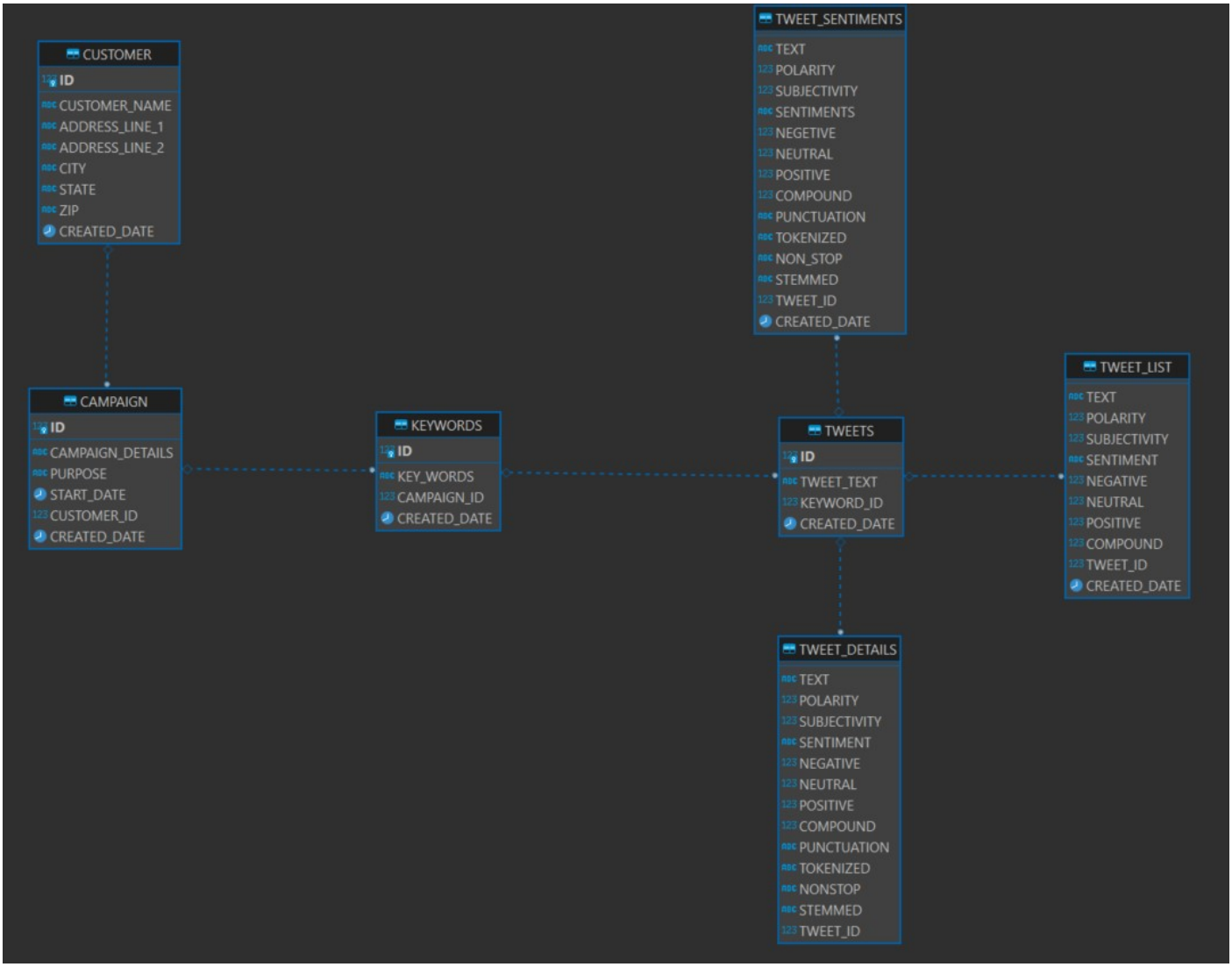
# Project Description

This project is based on retrieving twitter data from their website through a developer api and run some basic analysis on the data.

# Logical Model



# Physical Model

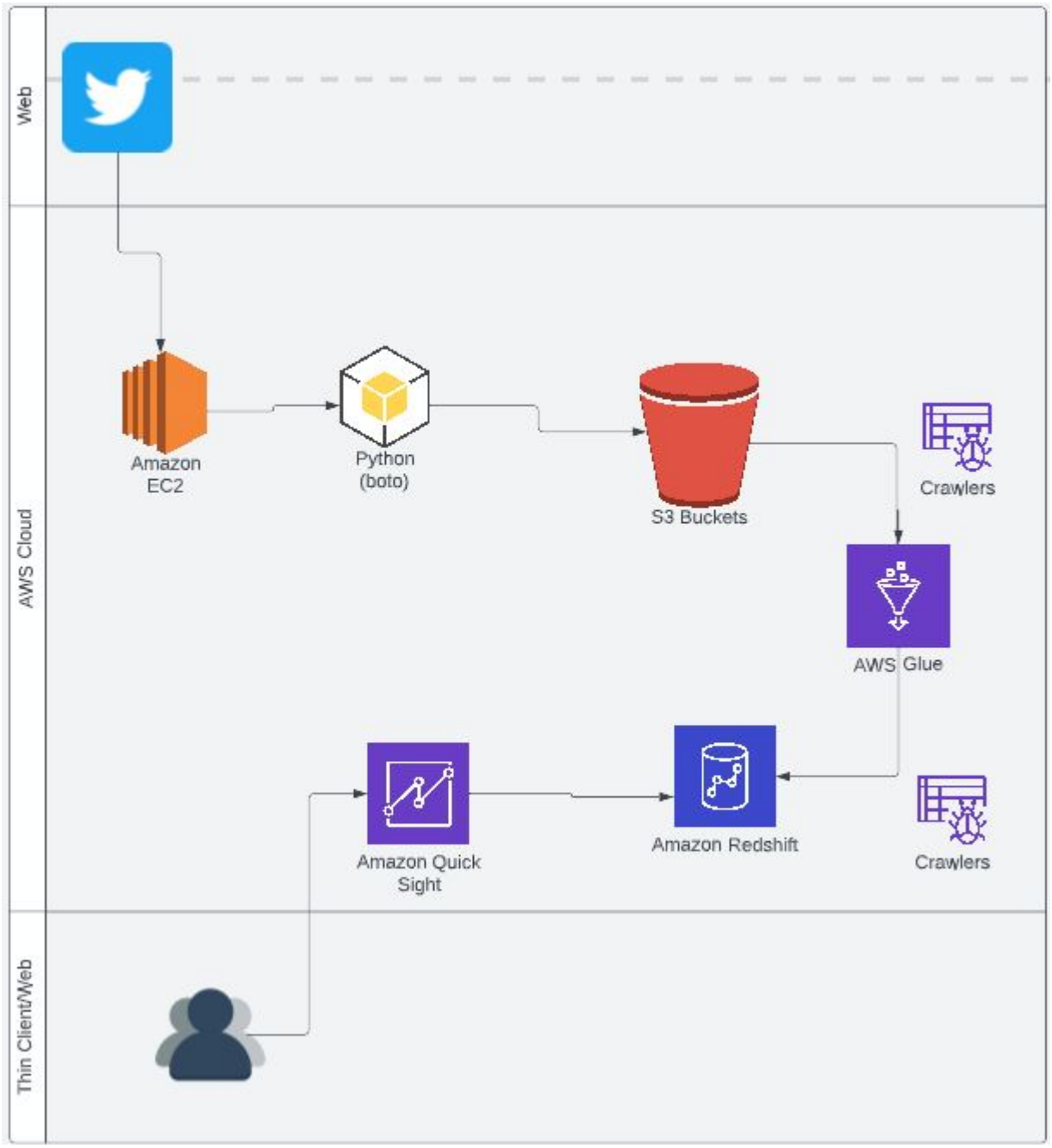


# DDL

```
-- public."CUSTOMER" definition

-- Drop table

-- DROP TABLE public."CUSTOMER";

CREATE TABLE public."CUSTOMER" ( "ID" serial4 NOT NULL, "CUSTOMER_NAME" varchar(1000) NULL, "ADDRESS_LINE_1" varchar(100) NULL, "ADDRESS_LINE_2" varchar(100) NULL, "CITY" varchar(100) NULL, "STATE" varchar(50) NULL, "ZIP" varchar(5) NULL, "CREATED_DATE" date NULL, CONSTRAINT "CUSTOMER_pkey" PRIMARY KEY ("ID") );

-- public."CAMPAIGN" definition

-- Drop table

-- DROP TABLE public."CAMPAIGN";

CREATE TABLE public."CAMPAIGN" ( "ID" int4 NOT NULL DEFAULT nextval('"CAMPAIGN_id_seq"'::regclass), "CAMPAIGN_DETAILS" varchar(1000) NULL, "PURPOSE" varchar(100) NULL, "START_DATE" date NULL, "CUSTOMER_ID" int4 NULL, "CREATED_DATE" date NULL, CONSTRAINT "CAMPAIGN_pkey" PRIMARY KEY ("ID"), CONSTRAINT fk_cus_to_cmpn FOREIGN KEY ("CUSTOMER_ID") REFERENCES public."CUSTOMER" ("ID") );

-- public."KEYWORDS" definition

-- Drop table

-- DROP TABLE public."KEYWORDS";

CREATE TABLE public."KEYWORDS" ( "ID" int4 NOT NULL DEFAULT nextval('"KEYWORDS_id_seq"'::regclass), "KEY_WORDS" varchar(1000) NULL, "CAMPAIGN_ID" int4 NULL, "CREATED_DATE" date NULL, CONSTRAINT "KEYWORDS_pkey" PRIMARY KEY ("ID"), CONSTRAINT fk_cus_to_cmpn FOREIGN KEY ("CAMPAIGN_ID") REFERENCES public."CAMPAIGN"("ID") );

-- public."TWEETS" definition

-- Drop table

-- DROP TABLE public."TWEETS";

CREATE TABLE public."TWEETS" ( "ID" int4 NOT NULL DEFAULT nextval('tweets_id_seq'::regclass), "TWEET_TEXT" varchar(1000) NULL, "KEYWORD_ID" int4 NULL, "CREATED_DATE" date NULL, CONSTRAINT tweets_pkey PRIMARY KEY ("ID"), CONSTRAINT fk_keywords_to_tweets FOREIGN KEY ("KEYWORD_ID") REFERENCES public."KEYWORDS"("ID") );

-- public."TWEET_DETAILS" definition

-- Drop table

-- DROP TABLE public."TWEET_DETAILS";
```

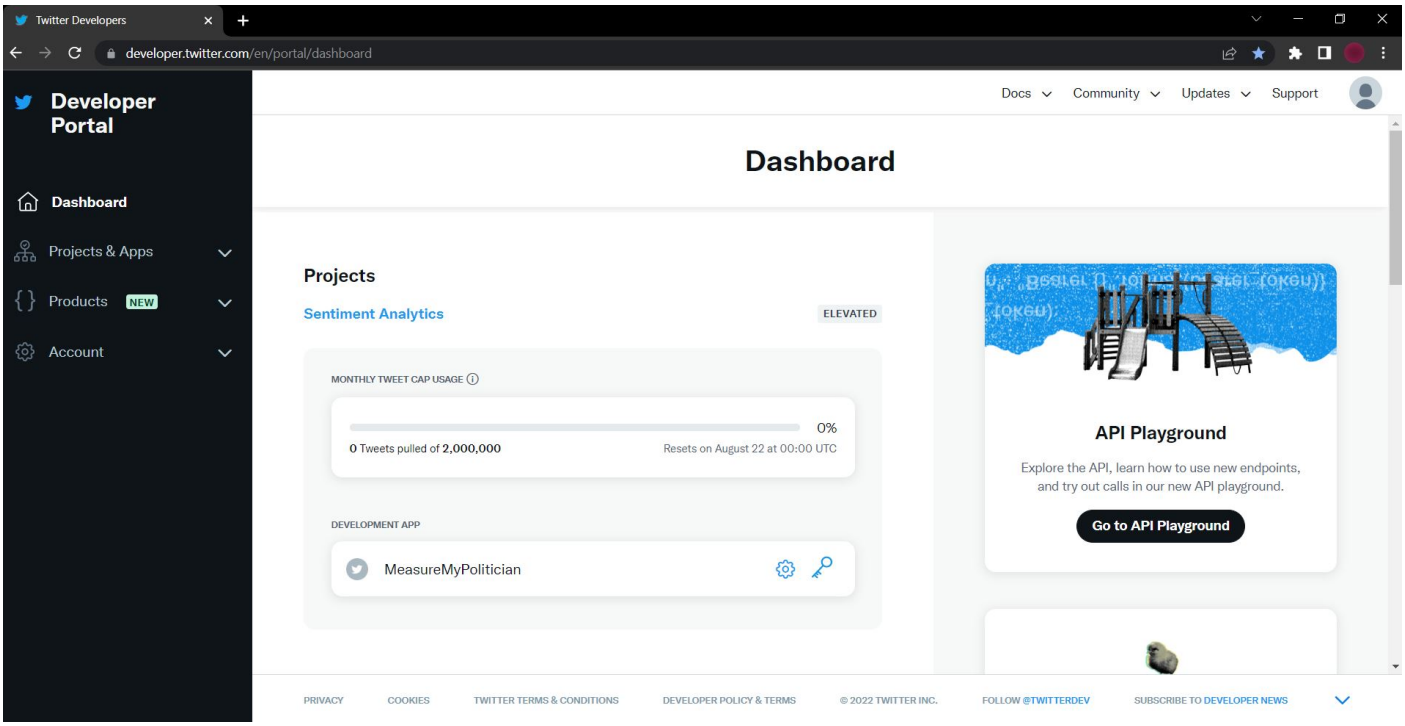
```
CREATE TABLE public."TWEET_DETAILS" ( "TEXT" varchar(1000) NULL, "POLARITY" float4 NULL, "SUBJECTIVITY" float4 NULL, "SENTIMENT" varchar(50) NULL, "NEGATIVE" float4 NULL, "NEUTRAL" float4 NULL, "POSITIVE" float4 NULL, "COMPOUND" float4 NULL, "PUNCTUATION" varchar(256) NULL, "TOKENIZED" varchar(256) NULL, "NONSTOP" varchar(256) NULL, "STEMMED" varchar(256) NULL, "TWEET_ID" int4 NULL, CONSTRAINT fk_td_to_tweets FOREIGN KEY ("TWEET_ID") REFERENCES public."TWEETS"("ID") );

-- public."TWEET_LIST" definition

-- Drop table

-- DROP TABLE public."TWEET_LIST";

CREATE TABLE public."TWEET_LIST" ( "TEXT" varchar(256) NULL, "POLARITY" float4 NULL, "SUBJECTIVITY" float4 NULL, "SENTIMENT" varchar(50) NULL, "NEGATIVE" float4 NULL, "NEUTRAL" float4 NULL, "POSITIVE" float4 NULL, "COMPOUND" float4 NULL, "TWEET_ID" int4 NULL, "CREATED_DATE" date NULL, CONSTRAINT fk_tl_to_tweets FOREIGN KEY ("TWEET_ID") REFERENCES public."TWEETS"("ID") );

-- public."TWEET_SENTIMENTS" definition

-- Drop table

-- DROP TABLE public."TWEET_SENTIMENTS";

CREATE TABLE public."TWEET_SENTIMENTS" ( "TEXT" varchar(256) NULL, "POLARITY" float4 NULL, "SUBJECTIVITY" float4 NULL, "SENTIMENTS" varchar(50) NULL, "NEGETIVE" float4 NULL, "NEUTRAL" float4 NULL, "POSITIVE" float4 NULL, "COMPOUND" float4 NULL, "PUNCTUATION" varchar(256) NULL, "TOKENIZED" varchar(256) NULL, "NON_STOP" varchar(256) NULL, "STEMMED" varchar(256) NULL, "TWEET_ID" int4 NULL, "CREATED_DATE" date NULL, CONSTRAINT fk_ts_to_tweets FOREIGN KEY ("TWEET_ID") REFERENCES public."TWEETS"("ID") );
```

# Tech Stack


Web
AWS Cloud
Thin Client/Web
Amazon EC2
Python (boto)
S3 Buckets
Crawlers
AWS Glue
Amazon Quick Sight
Amazon Redshift
Crawlers

# Twitter

## Developer Account



In [1]:
```
# Install Libraries
!pip install textblob
!pip install tweepy
!pip install boto3 pandas s3fs
!pip install pycountry
!pip install wordcloud
!pip install langdetect
```

```
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
ws.com
Requirement already satisfied: textblob in /home/ec2-user/anaconda3/envs/amaz
onei_mxnet_p36/lib/python3.6/site-packages (0.17.1)
Requirement already satisfied: nltk>=3.1 in /home/ec2-user/anaconda3/envs/ama
zonei_mxnet_p36/lib/python3.6/site-packages (from textblob) (3.6.7)
Requirement already satisfied: tqdm in /home/ec2-user/anaconda3/envs/amazonei
_mxnet_p36/lib/python3.6/site-packages (from nltk>=3.1->textblob) (4.63.0)
Requirement already satisfied: click in /home/ec2-user/anaconda3/envs/amazone
i_mxnet_p36/lib/python3.6/site-packages (from nltk>=3.1->textblob) (7.1.2)
Requirement already satisfied: regex>=2021.8.3 in /home/ec2-user/anaconda3/en
vs/amazonei_mxnet_p36/lib/python3.6/site-packages (from nltk>=3.1->textblob)
(2022.3.15)
Requirement already satisfied: joblib in /home/ec2-user/anaconda3/envs/amazon
ei_mxnet_p36/lib/python3.6/site-packages (from nltk>=3.1->textblob) (1.0.1)
Requirement already satisfied: importlib-resources in /home/ec2-user/anaconda
3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from tqdm->nltk>=3.1->
textblob) (5.4.0)
Requirement already satisfied: zipp>=3.1.0 in /home/ec2-user/anaconda3/envs/a
mazonei_mxnet_p36/lib/python3.6/site-packages (from importlib-resources->tqdm
->nltk>=3.1->textblob) (3.4.0)
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
ws.com
Requirement already satisfied: tweepy in /home/ec2-user/anaconda3/envs/amazon
ei_mxnet_p36/lib/python3.6/site-packages (4.6.0)
Requirement already satisfied: oauthlib<4,>=3.2.0 in /home/ec2-user/anaconda
3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from tweepy) (3.2.0)
Requirement already satisfied: requests<3,>=2.27.0 in /home/ec2-user/anaconda
3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from tweepy) (2.27.1)
Requirement already satisfied: requests-oauthlib<2,>=1.2.0 in /home/ec2-user/
anaconda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from tweepy)
(1.3.1)
Requirement already satisfied: charset-normalizer~=2.0.0 in /home/ec2-user/an
aconda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from requests<3,
>=2.27.0->tweepy) (2.0.12)
Requirement already satisfied: idna<4,>=2.5 in /home/ec2-user/anaconda3/envs/
amazonei_mxnet_p36/lib/python3.6/site-packages (from requests<3,>=2.27.0->twe
epy) (3.1)
Requirement already satisfied: certifi>=2017.4.17 in /home/ec2-user/anaconda
3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from requests<3,>=2.2
7.0->tweepy) (2021.5.30)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /home/ec2-user/anacon
da3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from requests<3,>=2.
27.0->tweepy) (1.26.8)
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
ws.com
Requirement already satisfied: boto3 in /home/ec2-user/anaconda3/envs/amazone
i_mxnet_p36/lib/python3.6/site-packages (1.21.42)
Requirement already satisfied: pandas in /home/ec2-user/anaconda3/envs/amazon
ei_mxnet_p36/lib/python3.6/site-packages (1.1.5)
Requirement already satisfied: s3fs in /home/ec2-user/anaconda3/envs/amazonei
_mxnet_p36/lib/python3.6/site-packages (0.4.2)
Requirement already satisfied: botocore<1.25.0,>=1.24.42 in /home/ec2-user/an
aconda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from boto3) (1.2
4.42)
```

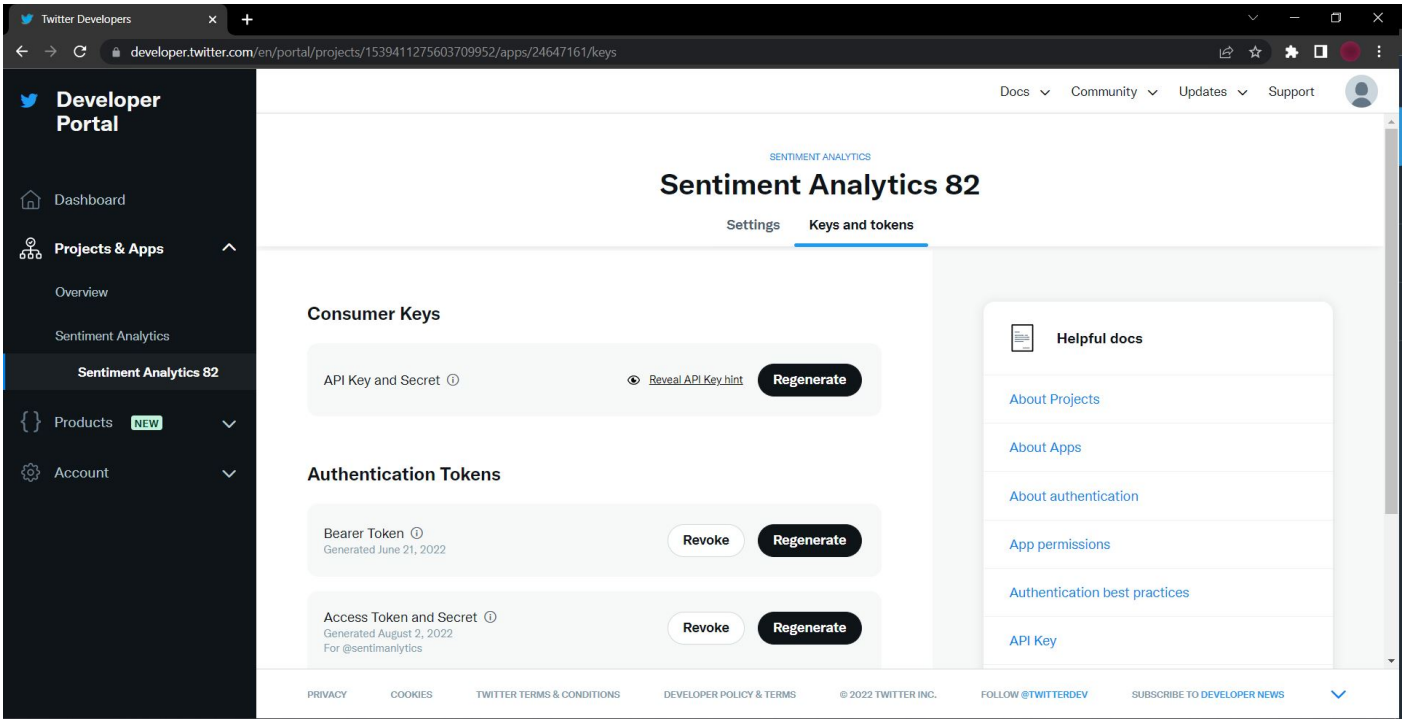
```
Requirement already satisfied: jmespath<2.0.0,>=0.7.1 in /home/ec2-user/anaco
nda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from boto3) (0.10.
0)
Requirement already satisfied: s3transfer<0.6.0,>=0.5.0 in /home/ec2-user/ana
conda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from boto3) (0.5.
2)
Requirement already satisfied: python-dateutil>=2.7.3 in /home/ec2-user/anaco
nda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from pandas) (2.8.
1)
Requirement already satisfied: pytz>=2017.2 in /home/ec2-user/anaconda3/envs/
amazonei_mxnet_p36/lib/python3.6/site-packages (from pandas) (2021.1)
Requirement already satisfied: numpy>=1.15.4 in /home/ec2-user/anaconda3/env
s/amazonei_mxnet_p36/lib/python3.6/site-packages (from pandas) (1.19.5)
Requirement already satisfied: fsspec>=0.6.0 in /home/ec2-user/anaconda3/env
s/amazonei_mxnet_p36/lib/python3.6/site-packages (from s3fs) (0.8.7)
Requirement already satisfied: urllib3<1.27,>=1.25.4 in /home/ec2-user/anacon
da3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from botocore<1.25.
0,>=1.24.42->boto3) (1.26.8)
Requirement already satisfied: importlib-metadata in /home/ec2-user/anaconda
3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from fsspec>=0.6.0->s3
fs) (3.6.0)
Requirement already satisfied: six>=1.5 in /home/ec2-user/anaconda3/envs/amaz
onei_mxnet_p36/lib/python3.6/site-packages (from python-dateutil>=2.7.3->pand
as) (1.15.0)
Requirement already satisfied: typing-extensions>=3.6.4 in /home/ec2-user/ana
conda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from importlib-me
tadata->fsspec>=0.6.0->s3fs) (4.1.1)
Requirement already satisfied: zipp>=0.5 in /home/ec2-user/anaconda3/envs/ama
zonei_mxnet_p36/lib/python3.6/site-packages (from importlib-metadata->fsspec>
=0.6.0->s3fs) (3.4.0)
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
ws.com
Requirement already satisfied: pycountry in /home/ec2-user/anaconda3/envs/ama
zonei_mxnet_p36/lib/python3.6/site-packages (22.3.5)
Requirement already satisfied: setuptools in /home/ec2-user/anaconda3/envs/am
azonei_mxnet_p36/lib/python3.6/site-packages (from pycountry) (49.6.0.post202
10108)
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
ws.com
Requirement already satisfied: wordcloud in /home/ec2-user/anaconda3/envs/ama
zonei_mxnet_p36/lib/python3.6/site-packages (1.8.2.2)
Requirement already satisfied: pillow in /home/ec2-user/anaconda3/envs/amazon
ei_mxnet_p36/lib/python3.6/site-packages (from wordcloud) (8.4.0)
Requirement already satisfied: numpy>=1.6.1 in /home/ec2-user/anaconda3/envs/
amazonei_mxnet_p36/lib/python3.6/site-packages (from wordcloud) (1.19.5)
Requirement already satisfied: matplotlib in /home/ec2-user/anaconda3/envs/am
azonei_mxnet_p36/lib/python3.6/site-packages (from wordcloud) (3.3.4)
Requirement already satisfied: kiwisolver>=1.0.1 in /home/ec2-user/anaconda3/
envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from matplotlib->wordclo
ud) (1.3.1)
Requirement already satisfied: python-dateutil>=2.1 in /home/ec2-user/anacond
a3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from matplotlib->word
cloud) (2.8.1)
Requirement already satisfied: cycler>=0.10 in /home/ec2-user/anaconda3/envs/
amazonei_mxnet_p36/lib/python3.6/site-packages (from matplotlib->wordcloud)
(0.10.0)
```

```
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.3 in /h
ome/ec2-user/anaconda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (f
rom matplotlib->wordcloud) (2.4.7)
Requirement already satisfied: six in /home/ec2-user/anaconda3/envs/amazonei_
mxnet_p36/lib/python3.6/site-packages (from cycler>=0.10->matplotlib->wordclo
ud) (1.15.0)
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
ws.com
Requirement already satisfied: langdetect in /home/ec2-user/anaconda3/envs/am
azonei_mxnet_p36/lib/python3.6/site-packages (1.0.9)
Requirement already satisfied: six in /home/ec2-user/anaconda3/envs/amazonei_
mxnet_p36/lib/python3.6/site-packages (from langdetect) (1.15.0)
```

In [2]:
```
# Import Libraries
from textblob import TextBlob
import sys
import tweepy
import matplotlib.pyplot as plt
import pandas as pd
import nltk
nltk.download('punkt')
nltk.download('vader_lexicon')
nltk.download('stopwords')
import numpy as np
import os
import boto3
from botocore.exceptions import ClientError
import io
import nltk
from pycountry import pycountry
import re
import string
from wordcloud import WordCloud, STOPWORDS
from PIL import Image
from nltk.sentiment.vader import SentimentIntensityAnalyzer
from langdetect import detect
from nltk.stem import SnowballStemmer
from nltk.sentiment.vader import SentimentIntensityAnalyzer
from sklearn.feature_extraction.text import CountVectorizer
from pprint import pprint
import pathlib
```

```
[nltk_data] Downloading package punkt to /home/ec2-user/nltk_data...
[nltk_data]   Package punkt is already up-to-date!
[nltk_data] Downloading package vader_lexicon to
[nltk_data]     /home/ec2-user/nltk_data...
[nltk_data]   Package vader_lexicon is already up-to-date!
[nltk_data] Downloading package stopwords to
[nltk_data]     /home/ec2-user/nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
```

# Application



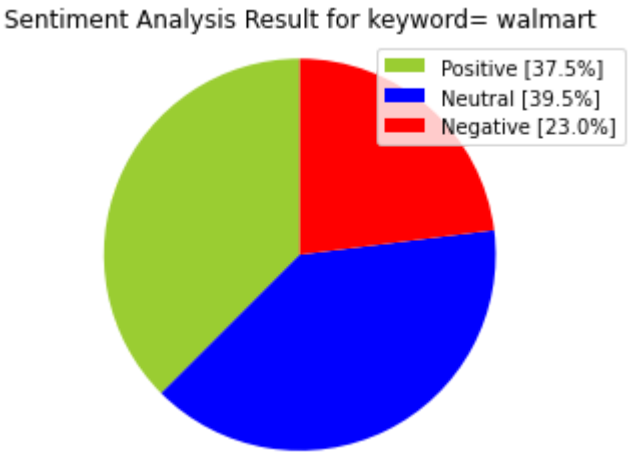

In [3]:
```
# Authentication
consumerKey = '*****************************'
consumerSecret = '*****************************'
accessToken = '*****************************'
accessTokenSecret = '*****************************'
auth = tweepy.OAuthHandler(consumerKey, consumerSecret)
auth.set_access_token(accessToken, accessTokenSecret)
api = tweepy.API(auth)
```

In [4]:
```
#Sentiment Analysis
def percentage(part,whole):
 return 100 * float(part)/float(whole)
keyword = input("Please enter keyword or hashtag to search: ")
noOfTweet = int(input ("Please enter how many tweets to analyze: "))
tweets = tweepy.Cursor(api.search_tweets, q=keyword).items(noOfTweet)
positive = 0
negative = 0
neutral = 0
polarity = 0
tweet_list = []
neutral_list = []
negative_list = []
positive_list = []
for tweet in tweets:

 #print(tweet.text)
 tweet_list.append(tweet.text)
 analysis = TextBlob(tweet.text)
 score = SentimentIntensityAnalyzer().polarity_scores(tweet.text)
 neg = score['neg']
 neu = score['neu']
 pos = score['pos']
 comp = score['compound']
 polarity += analysis.sentiment.polarity

 if neg > pos:
     negative_list.append(tweet.text)
     negative += 1
 elif pos > neg:
     positive_list.append(tweet.text)
     positive += 1

 elif pos == neg:
     neutral_list.append(tweet.text)
     neutral += 1

positive = percentage(positive, noOfTweet)
negative = percentage(negative, noOfTweet)
neutral = percentage(neutral, noOfTweet)
polarity = percentage(polarity, noOfTweet)
positive = format(positive, '.1f')
negative = format(negative, '.1f')
neutral = format(neutral, '.1f')
```

In [5]:
```
#Number of Tweets (Total, Positive, Negative, Neutral)
tweet_list = pd.DataFrame(tweet_list)
neutral_list = pd.DataFrame(neutral_list)
negative_list = pd.DataFrame(negative_list)
positive_list = pd.DataFrame(positive_list)
print("total number: ",len(tweet_list))
print("positive number: ",len(positive_list))
print("negative number: ", len(negative_list))
print("neutral number: ",len(neutral_list))
```

```
total number:  200
positive number:  75
negative number:  46
neutral number:  79
```

In [6]:
```
#Creating PieCart
labels = ['Positive ['+str(positive)+'%]' , 'Neutral ['+str(neutral)+'%]','Neg
ative ['+str(negative)+'%]']
sizes = [positive, neutral, negative]
colors = ['yellowgreen', 'blue','red']
patches, texts = plt.pie(sizes,colors=colors, startangle=90)
plt.style.use('default')
plt.legend(labels)
plt.title("Sentiment Analysis Result for keyword= "+keyword+"" )
plt.axis('equal')
plt.show()
```




In [7]:
```
keyword = pd.DataFrame(
    data={"KeyWords": [keyword]},
    columns=["KeyWords"],
)

#keyword.to_csv("/home/ec2-user/twitter-analytics/keyword.csv")
```

In [8]:
```
AWS_S3_BUCKET = "*****************************"
AWS_ACCESS_KEY_ID = "*****************************"
AWS_SECRET_ACCESS_KEY = "*****************************"
AWS_REGION_NAME = "us-east-1"

s3_client = boto3.client(
    "s3",
    region_name=AWS_REGION_NAME,
    aws_access_key_id= AWS_ACCESS_KEY_ID,
    aws_secret_access_key=AWS_SECRET_ACCESS_KEY,
)
```

```
/home/ec2-user/anaconda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages/
boto3/compat.py:88: PythonDeprecationWarning: Boto3 will no longer support Py
thon 3.6 starting May 30, 2022. To continue receiving service updates, bug fi
xes, and security updates please upgrade to Python 3.7 or later. More informa
tion can be found here: https://aws.amazon.com/blogs/developer/python-support
-policy-updates-for-aws-sdks-and-tools/
  warnings.warn(warning, PythonDeprecationWarning)
```

In [9]:
```
#Upload Tweet FIle to S3, converting it form data frame to a csv file
with io.StringIO() as csv_buffer:
    tweet_list.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/tweet_list.csv", Body=csv_buffer.getv
alue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")

    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

```
Successful S3 put_object response. Status - 200
```

In [10]:
```
 # Upload File for the neutral list created
with io.StringIO() as csv_buffer:
    neutral_list.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/neutral_list.csv", Body=csv_buffer.ge
tvalue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")

    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

```
Successful S3 put_object response. Status - 200
```

In [11]:
```
# Upload File for negative tweets
with io.StringIO() as csv_buffer:
    negative_list.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/negative_list.csv", Body=csv_buffer.g
etvalue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")

    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

```
Successful S3 put_object response. Status - 200
```

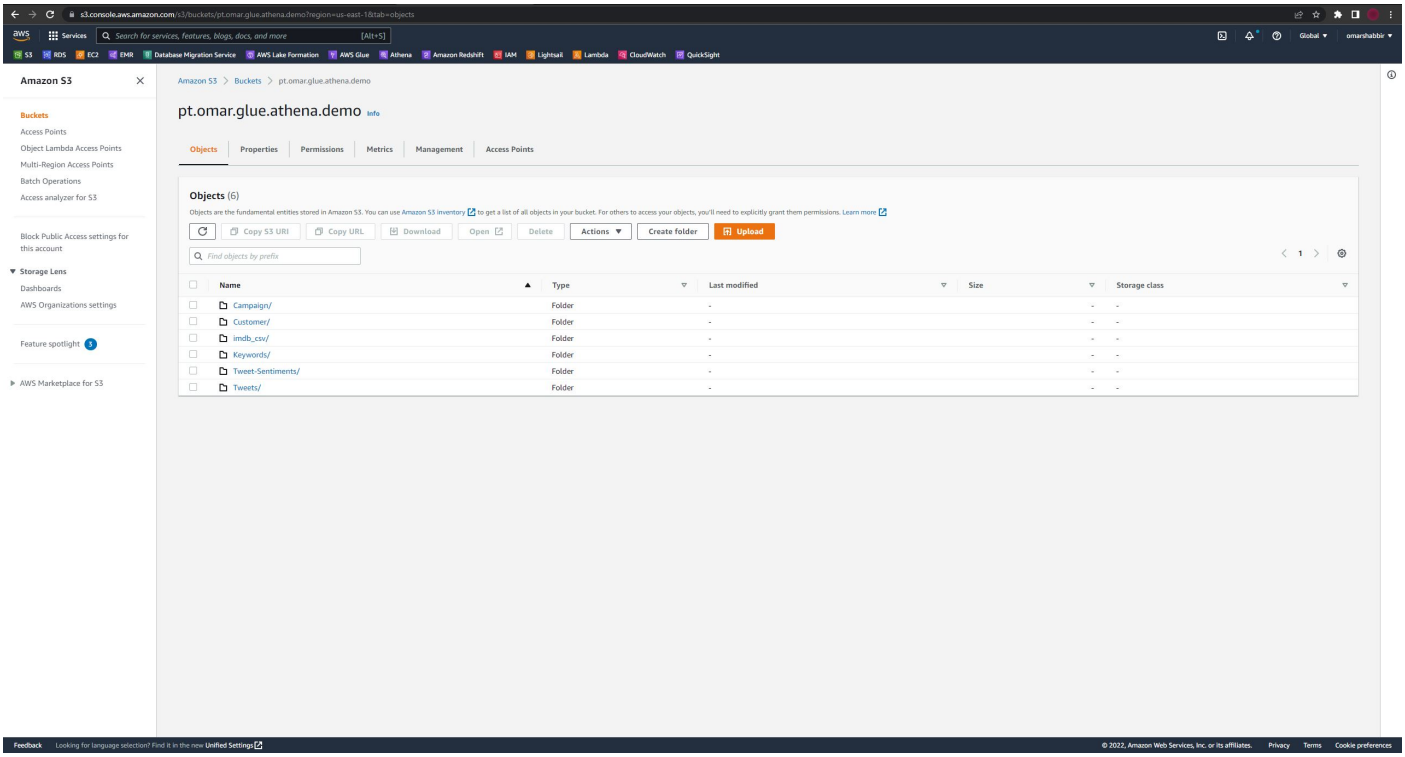
In [12]:
```
# Upload Files for positive tweets
with io.StringIO() as csv_buffer:
    positive_list.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/positive_list.csv", Body=csv_buffer.g
etvalue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")
    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

```
Successful S3 put_object response. Status - 200
```

In [13]:
```
# Upload the Keywords file
with io.StringIO() as csv_buffer:
    keyword.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/keyword.csv", Body=csv_buffer.getvalu
e()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")
    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

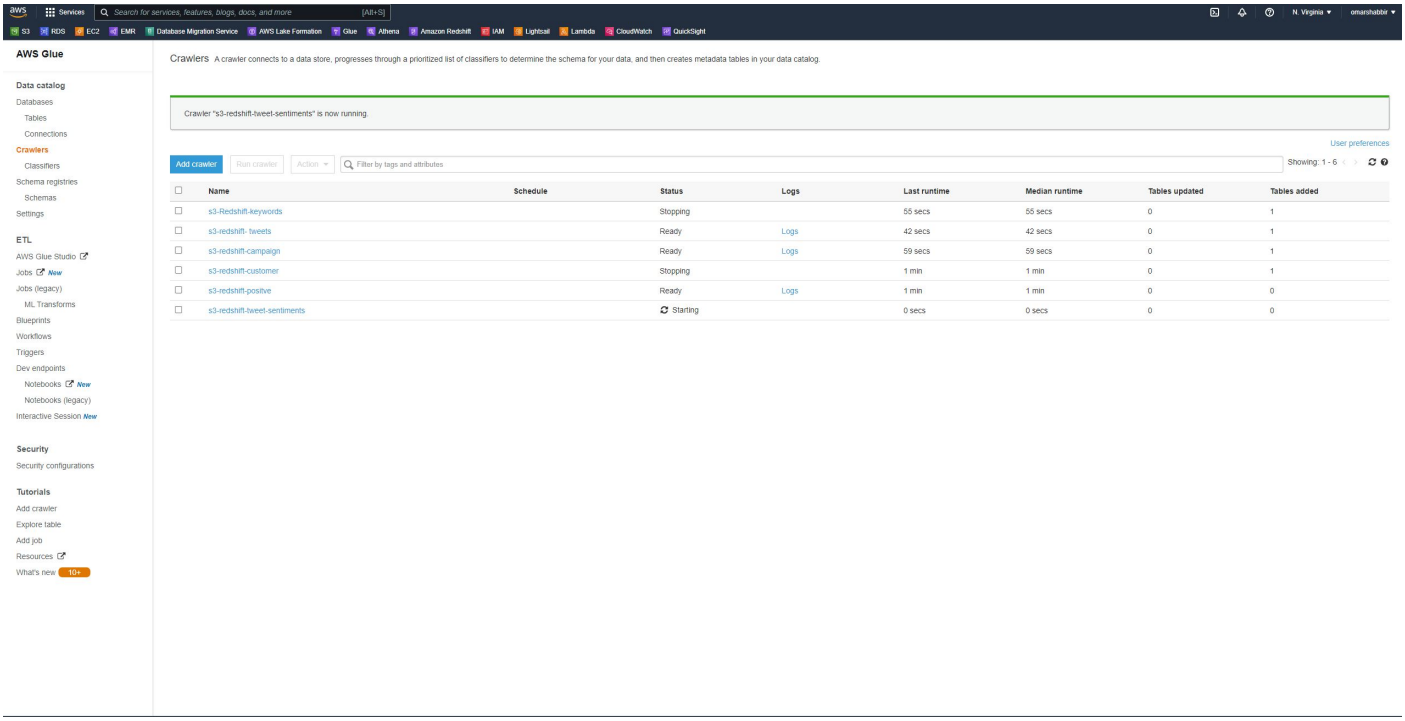
```
Successful S3 put_object response. Status - 200
```

# Uploaded files to S3

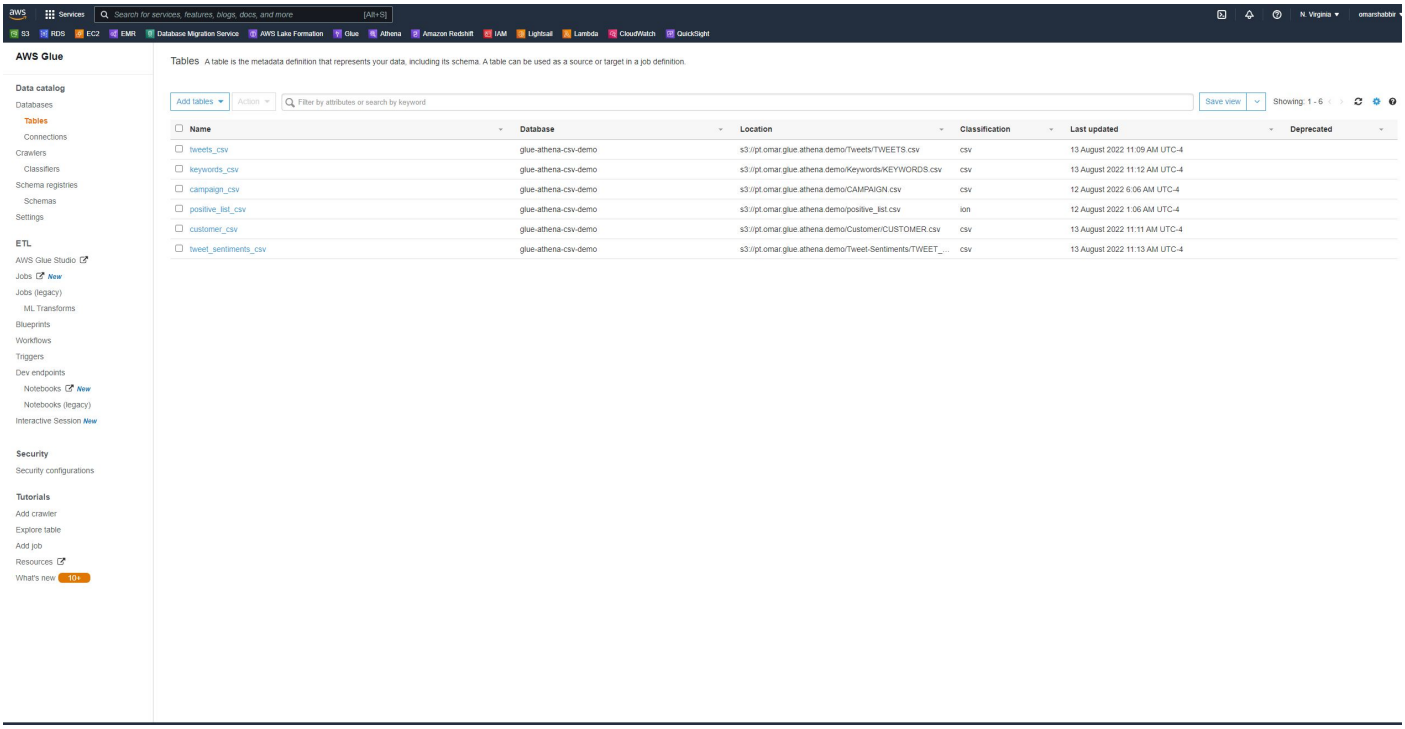


# Crawl Files to Redshift using Glue

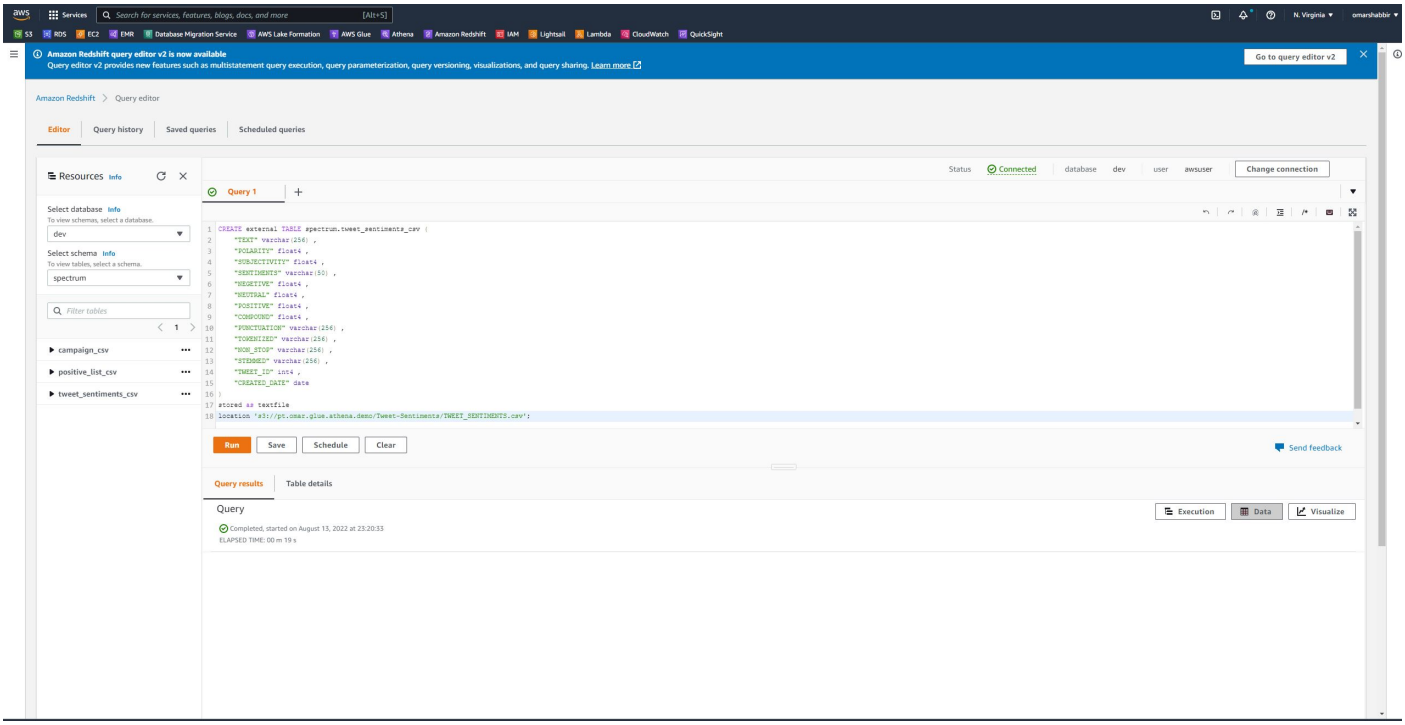
## Create Crawlers



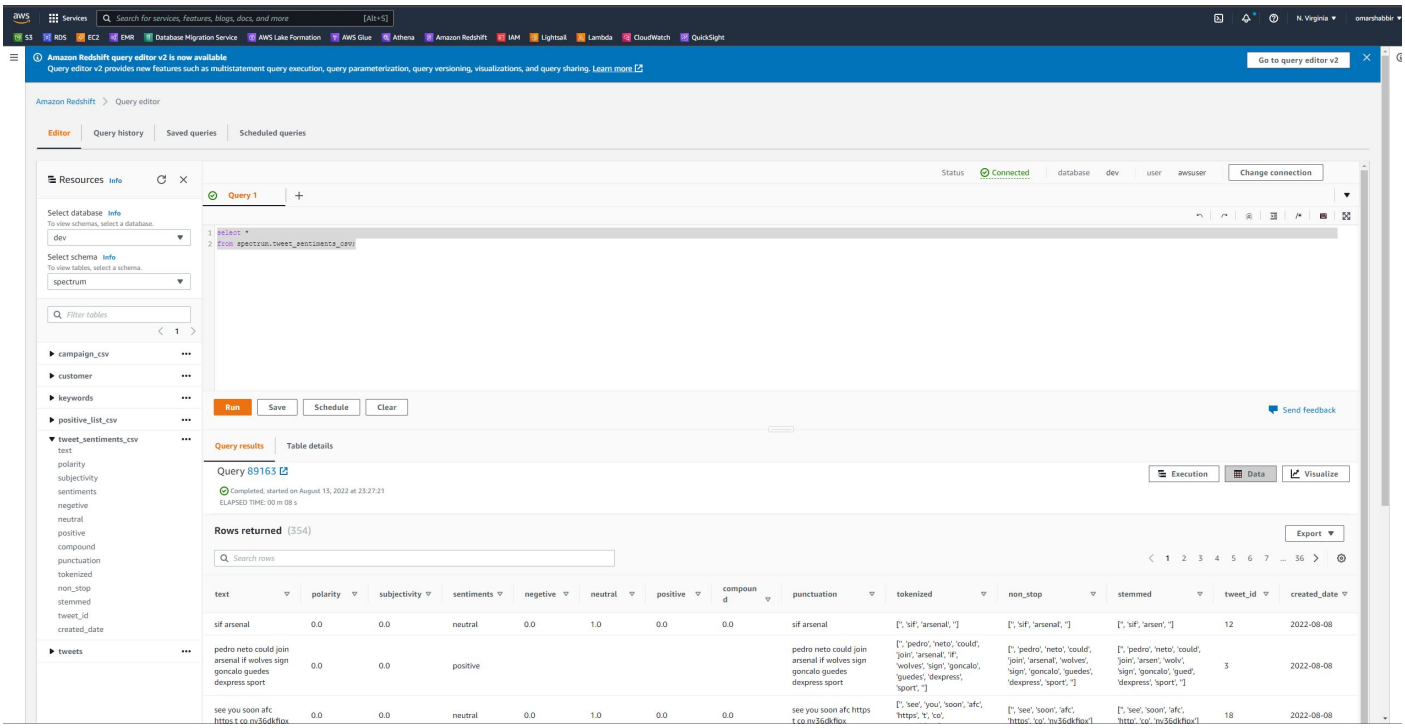

## Run Crawlers to creatre AWS Glue Tables



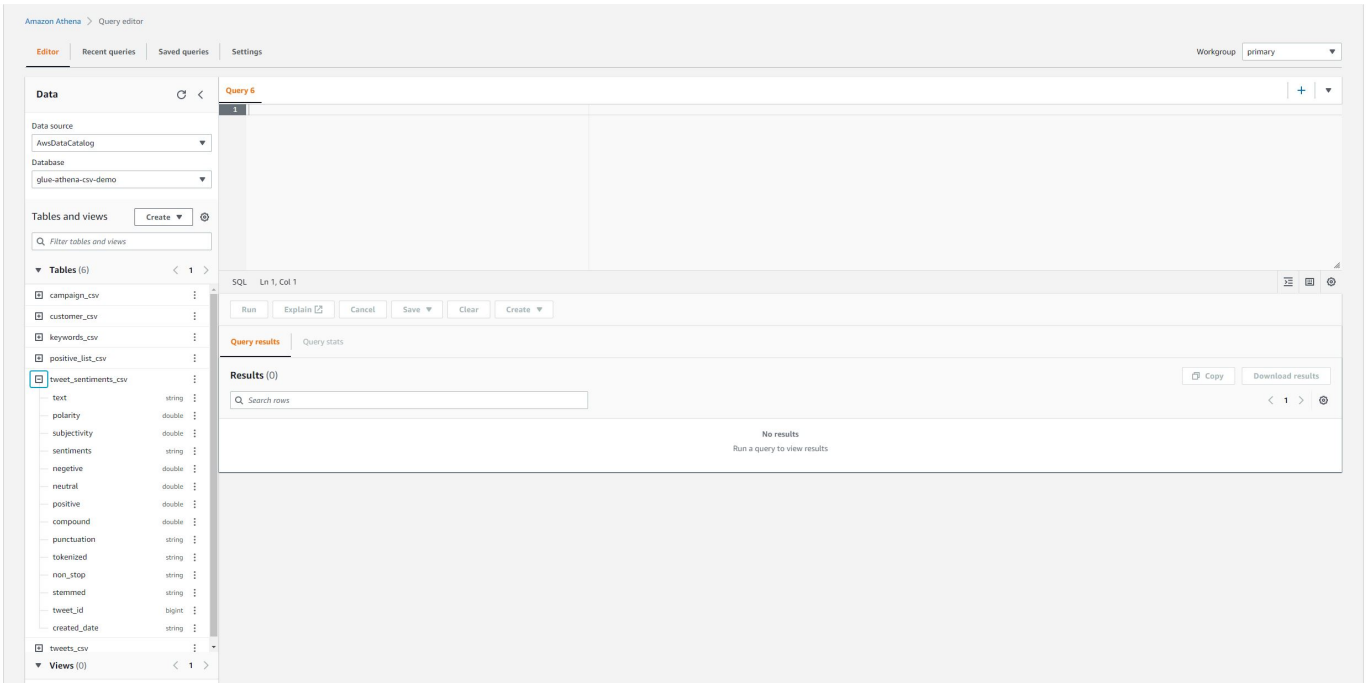

## Redshift Create External Tables



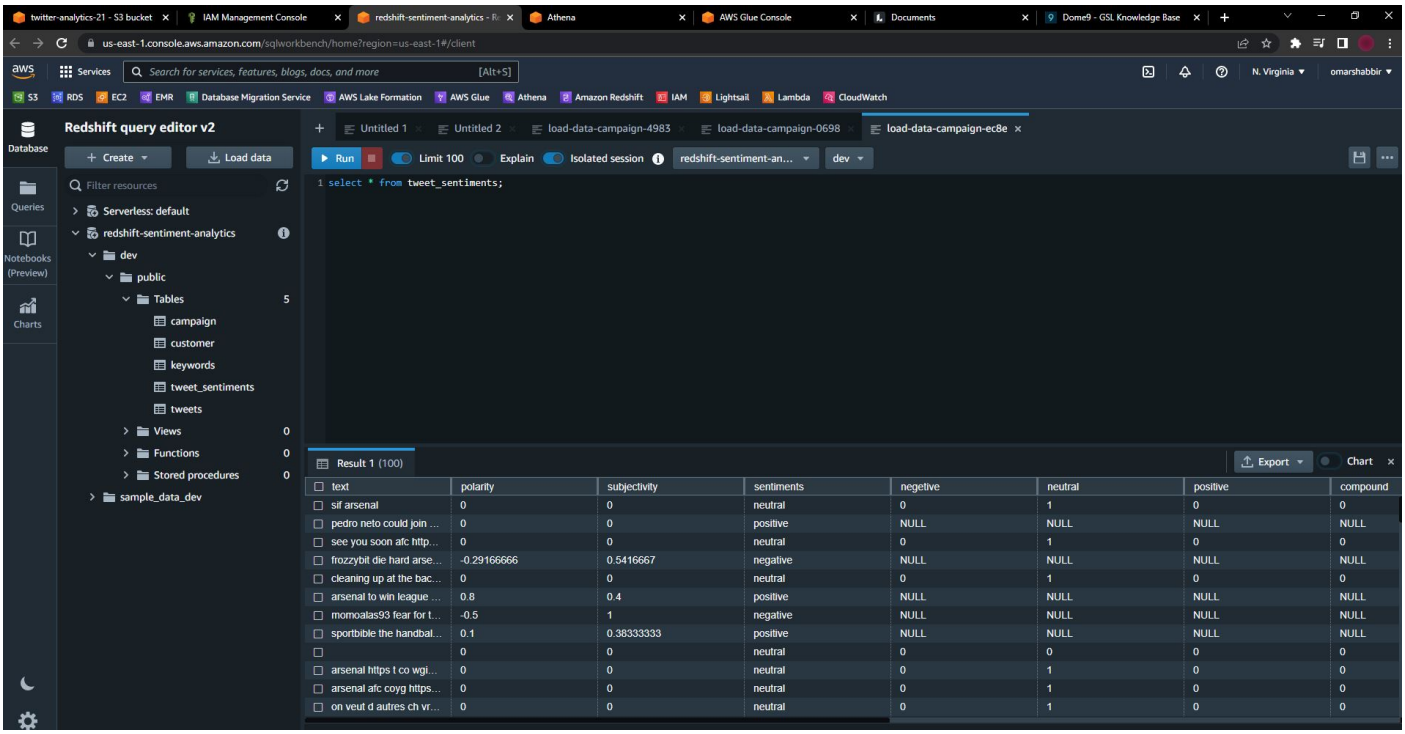

# RedShift Tweet Sentiments Table




# Athena Tweet Sentiments Table


Amazon Athena > Query editor
Editor
Recent queries
Saved queries
Settings
Workgroup primary
Data
Data source
AwsDataCatalog
Database
glue-athena-csv-demo
Tables and views
Create
Filter tables and views
Tables (6)
campaign_csv
customer_csv
keywords_csv
positive_list_csv
tweet_sentiments_csv
text string
polarity double
subjectivity double
sentiments string
negetive double
neutral double
positive double
compound double
punctuation string
tokenized string
non_stop string
stemmed string
tweet_id bigint
created_date string
tweets_csv
Views (0)
Query 6
SQL Ln 1, Col 1
Run
Explain
Cancel
Save
Clear
Create
Query results
Query stats
Results (0)
Copy
Download results
Search rows
No results
Run a query to view results

# Red Shift




In [14]:
```
# Cleaning Tweets to Analyze Tweets, dropping duplicates using drop_duplicates function

tweet_list.drop_duplicates(inplace = True)
```

In [15]:
```
#Cleaning Text (RT, Punctuation etc)

tw_list = pd.DataFrame(tweet_list)
tw_list["text"] = tw_list[0]

#Removing RT, Punctuation etc

remove_rt = lambda x: re.sub('RT @\w+: '," ",x)
 # print(remove_rt)
rt = lambda x:  re.sub(r"https?://\S+",' ',re.sub(r'[^A-Za-z0-9\s]+',' ',x))
tw_list["text"] = tw_list.text.map(remove_rt).map(rt)
tw_list["text"] = tw_list.text.str.lower()
tw_list.tail(10)
```

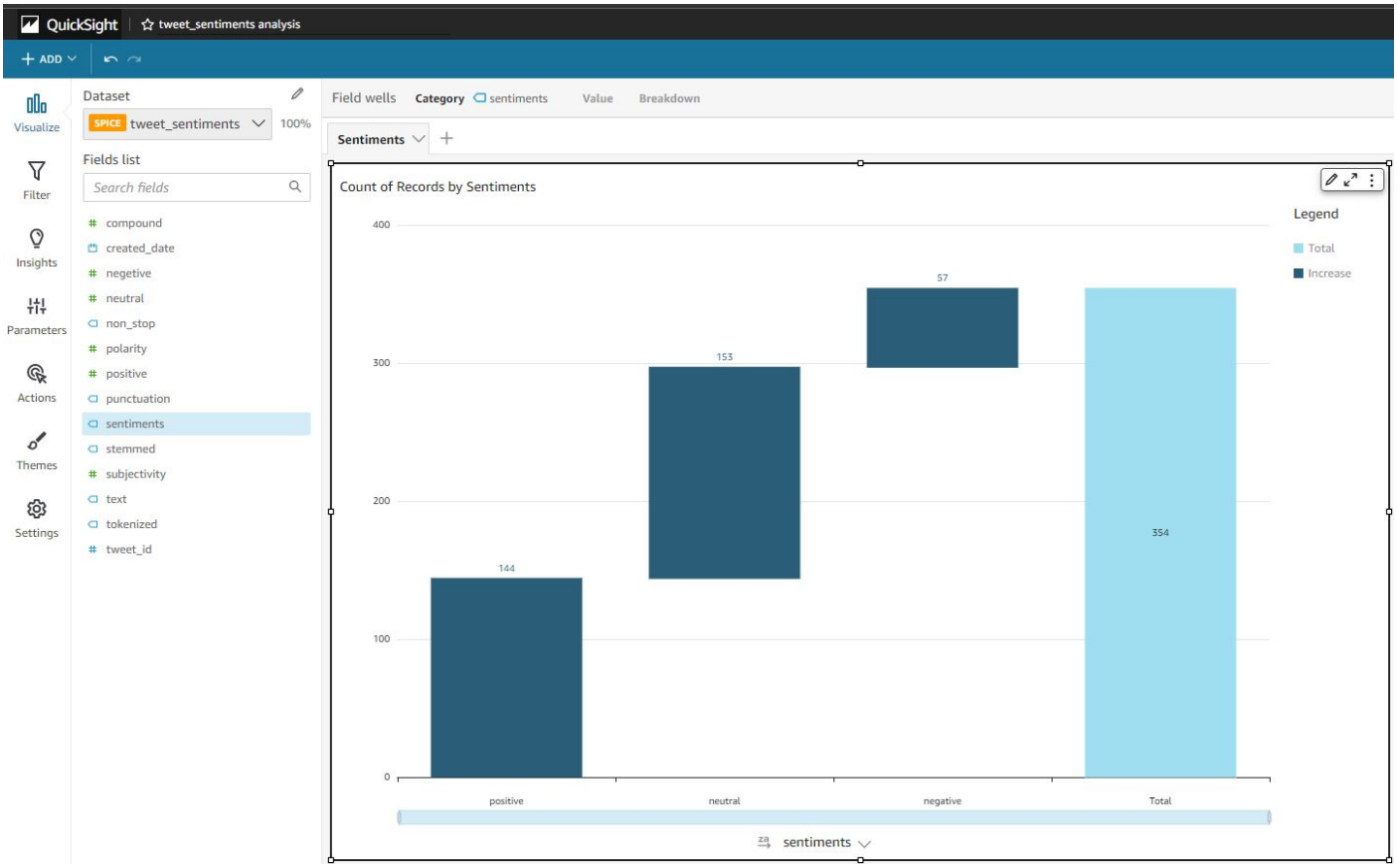
Out[15]:

| | 0 | text |
|---|---|---|
| **184** | The girl \n With the teeth that works \n At Wa... | the girl \n with the teeth that works \n at wa... |
| **185** | Walmart https://t.co/JtBPqvHnIO #Walmart | walmart https t co jtbpqvhnio walmart |
| **186** | RT @ZooCrochet_Tats: ¿Perdiste tu pulsera?\n#W... | perdiste tu pulsera \n walmart express jar... |
| **190** | That Zevo thing from Walmart works 🙌 | that zevo thing from walmart works |
| **191** | i did in fact drive my heat exhausted self to ... | i did in fact drive my heat exhausted self to ... |
| **193** | RT @ASchenna: #SummerReads \nA collection of s... | summerreads \na collection of short stories ... |
| **194** | @Andrea_Simmons @friendlycovid19 @mildmonkeypo... | andrea simmons friendlycovid19 mildmonkeypo... |
| **197** | @HarvestHillsYYC I will make a Walmart purchas... | harvesthillsyyc i will make a walmart purchas... |
| **198** | RT @vicsurvivaliste: Hier, tournée de supermar... | hier tourn e de supermarch s incluant walma... |
| **199** | conspiracy theory: supermarkets put barely any... | conspiracy theory supermarkets put barely any... |

In [16]:
```
#Using the clean data to calculate the polarity, sbjecivity, sentiment, -/+

tw_list[['polarity', 'subjectivity']] = tw_list['text'].apply(lambda Text: pd.
Series(TextBlob(Text).sentiment))
for index, row in tw_list['text'].iteritems():
 score = SentimentIntensityAnalyzer().polarity_scores(row)
 neg = score['neg']
 neu = score['neu']
 pos = score['pos']
 comp = score['compound']
 if neg > pos:
     tw_list.loc[index, 'sentiment'] = "negative"
 elif pos > neg:
     tw_list.loc[index, 'sentiment'] = "positive"
 else:
     tw_list.loc[index, 'sentiment'] = "neutral"
     tw_list.loc[index, 'neg'] = neg
     tw_list.loc[index, 'neu'] = neu
     tw_list.loc[index, 'pos'] = pos
     tw_list.loc[index, 'compound'] = comp
# tw_list.head(10)
```

# QuickSight

## Sentiments




## Subjectivity

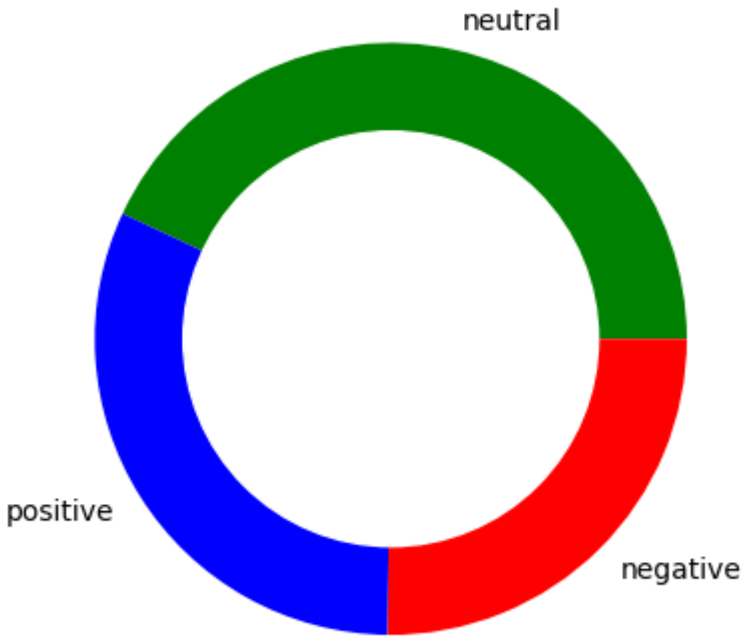

In [17]:
```
# Breaking data frame into 3

tw_list_negative = tw_list[tw_list["sentiment"]=="negative"]
tw_list_positive = tw_list[tw_list["sentiment"]=="positive"]
tw_list_neutral = tw_list[tw_list["sentiment"]=="neutral"]
```

In [18]:
```
# COunt for sentiments features
def count_values_in_column(data,feature):
 total=data.loc[:,feature].value_counts(dropna=False)
 percentage=round(data.loc[:,feature].value_counts(dropna=False,normalize=True
)*100,2)
 return pd.concat([total,percentage],axis=1,keys=['Total','Percentage'])
#Count_values for sentiment
count_values_in_column(tw_list,"sentiment")
```

Out[18]:

| | Total | Percentage |
|---|---|---|
| **neutral** | 65 | 43.05 |
| **positive** | 48 | 31.79 |
| **negative** | 38 | 25.17 |

In [19]:
```
# create data for Pie Chart
pichart = count_values_in_column(tw_list,"sentiment")
names= pichart.index
size= pichart["Percentage"]

# Create a circle for the center of the plot
my_circle=plt.Circle( (0,0), 0.7, color='white')
plt.pie(size, labels=names, colors=['green','blue','red'])
p=plt.gcf()
p.gca().add_artist(my_circle)
plt.show()
```




In [20]:
```
# Upload Files
with io.StringIO() as csv_buffer:
    tw_list.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/tw_list_sentiment.csv", Body=csv_buff
er.getvalue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")
    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

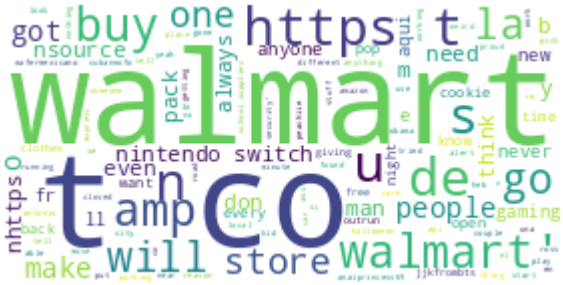
```
Successful S3 put_object response. Status - 200
```

In [21]:
```
#Creating new data frames for all sentiments (positive, negative and neutral)

tw_list_negative = tw_list[tw_list["sentiment"]=="negative"]
tw_list_positive = tw_list[tw_list["sentiment"]=="positive"]
tw_list_neutral = tw_list[tw_list["sentiment"]=="neutral"]
```

In [23]:
```
#Function to Create Wordcloud
def create_wordcloud(text):
 mask = np.array(Image.open("cloud.png"))
 stopwords = set(STOPWORDS)
 wc = WordCloud(background_color="white",
 mask = mask,
 max_words=3000,
 stopwords=stopwords,
 repeat=True)
 wc.generate(str(text))
 wc.to_file("wc.png")
 print("Word Cloud Saved Successfully")
 path="wc.png"
 display(Image.open(path))
```

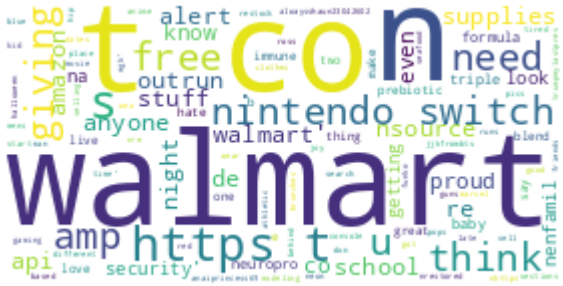
In [24]:
```
#Creating wordcloud for all tweets
create_wordcloud(tw_list["text"].values)
```

```
Word Cloud Saved Successfully
```



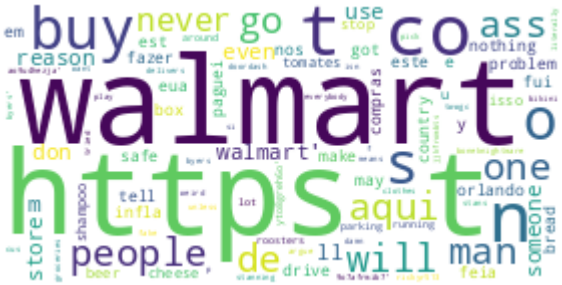

In [25]:
```
# for posticve tweets
create_wordcloud(tw_list_positive["text"].values)
```

```
Word Cloud Saved Successfully
```



In [26]:
```
# for negative
create_wordcloud(tw_list_negative["text"].values)
```

```
Word Cloud Saved Successfully
```



In [27]:
```
#Removing Punctuation

def remove_punct(text):
 text = "".join([char for char in text if char not in string.punctuation])
 text = re.sub('[0-9]+', '', text)
 return text
tw_list['punct'] = tw_list['text'].apply(lambda x: remove_punct(x))
#Appliyng tokenization
def tokenization(text):
    text = re.split('\W+', text)
    return text
tw_list['tokenized'] = tw_list['punct'].apply(lambda x: tokenization(x.lower
()))
#Removing stopwords
stopword = nltk.corpus.stopwords.words('english')
def remove_stopwords(text):
    text = [word for word in text if word not in stopword]
    return text

tw_list['nonstop'] = tw_list['tokenized'].apply(lambda x: remove_stopwords(x))
#Appliyng Stemmer
ps = nltk.PorterStemmer()
def stemming(text):
    text = [ps.stem(word) for word in text]
    return text
tw_list['stemmed'] = tw_list['nonstop'].apply(lambda x: stemming(x))
#Cleaning Text
def clean_text(text):
    text_lc = "".join([word.lower() for word in text if word not in string.pun
ctuation]) # remove puntuation
    text_rc = re.sub('[0-9]+', '', text_lc)
    tokens = re.split('\W+', text_rc)    # tokenization
    text = [ps.stem(word) for word in tokens if word not in stopword]  # remov
e stopwords and stemming
    return text
tw_list.head()

# Upload Files
with io.StringIO() as csv_buffer:
    tw_list.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/tw_list_de_punctuation.csv", Body=csv
_buffer.getvalue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")
    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

```
Successful S3 put_object response. Status - 200
```

In [28]:
```
#Appliyng Countvectorizer

countVectorizer = CountVectorizer(analyzer=clean_text)
countVector = countVectorizer.fit_transform(tw_list['text'])
print('{} Number of reviews has {} words'.format(countVector.shape[0], countVe
ctor.shape[1]))
#print(countVectorizer.get_feature_names())

count_vect_df = pd.DataFrame(countVector.toarray(), columns=countVectorizer.ge
t_feature_names())
count_vect_df.head()
```

```
151 Number of reviews has 950 words
```

Out[28]:

| | abl | accept | acid | advic | afford | afterwork | ago | agosto | ah | ... | yup | ywfylat | zevo | zma |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ... | 0 | 0 | 0 | |
| **1** | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ... | 0 | 0 | 0 | |
| **2** | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ... | 0 | 0 | 0 | |
| **3** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ... | 0 | 0 | 0 | |
| **4** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ... | 0 | 0 | 0 | |

5 rows × 950 columns

In [29]:
```
# Most Used Words
count = pd.DataFrame(count_vect_df.sum())
countdf = count.sort_values(0,ascending=False).head(20)
countdf[1:11]
```

Out[29]:

| | 0 |
|---|---|
| **walmart** | 116 |
| **http** | 64 |
| **co** | 63 |
| **de** | 13 |
| **get** | 12 |
| **like** | 10 |
| **go** | 9 |
| **amp** | 8 |
| **buy** | 7 |
| **nintendo** | 7 |

## References

1. https://towardsdatascience.com/ (https://towardsdatascience.com/)
2. https://www.analyticsvidhya.com/blog/2021/08/creating-customized-word-cloud-in-python/ (https://www.analyticsvidhya.com/blog/2021/08/creating-customized-word-cloud-in-python/)
3. https://dylancastillo.co/nlp-snippets-clean-and-tokenize-text-with-python/ (https://dylancastillo.co/nlp-snippets-clean-and-tokenize-text-with-python/) and class lessons

In [ ]: